



NEET SS MEDICINE

MEDICINE
FOUNDATION - 2

MARROW

GASTROENTEROLOGY

106



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APPROACH TO ALTERED LIVER CHEMISTRIES

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Introduction

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Clinical case :

History :

- A 58-year old gentleman, who is a known case of CAD s/p percutaneous transluminal coronary angioplasty on antiplatelets plus statins presented with pain abdomen since one week with high coloured urine followed by yellowish discolouration of eyes.
- He also complained of significant pruritis since the last three days.
- He had fever 1 week back.
- Working at a factory in Saudi Arabia.
- Has travelled straight from the airport to the casualty.
- He has taken some paracetamol from his nearby work clinic few days back.

Blood investigations :

- Chemistries :

Chemistries	First day	Second day
Direct bilirubin (DB)	2.46 (↑)	2.49
Indirect bilirubin (IB)	1.04	1.21
AST (Aspartate transaminase)	1025 (↑↑↑)	958
ALT (Alanine transaminase)	870 (↑↑↑)	804
ALP (Alkaline phosphatase)	665 (↑↑↑)	647
Total protein	7.4	-
Albumin	4.1	-
Urea	45	43.5
Creatinine	3.1 (↑)	2.9
Amylase	153 (↑)	-
Lipase	148 (↑)	-

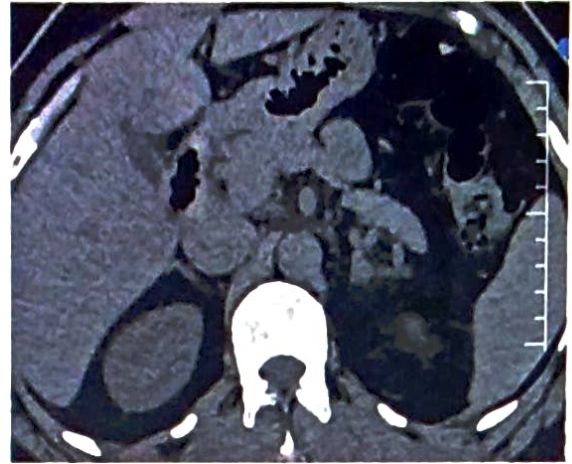
- Viral markers :

- HBsAg, HCV, HAV, HEV, EBV, Dengue NSI, Igm leptospira, Widal test : All are non reactive.

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Initial imaging :

- USG abdomen :
 - Findings : No gall stones were found, gall bladder wall thickening & possible intrahepatic biliary radical dilatation.
- Plain CT abdomen :
 - Contrast could not be given due to elevated creatinine for contrast CT scan.
 - Findings :
 - minimally distended gallbladder with mildly thickened and edematous wall with subtle pericholecystic fat stranding.
 - Tiny faint hyperdense structure at gallbladder neck.



Plain CT abdomen

Note :

- CT scan is not sensitive for gall stones/bile duct stones, as they are made of cholesterol.

Provisional syndromic diagnosis :

- Extra hepatic biliary obstruction with suspected choledocholithiasis (Passed off stone) with acute kidney injury (AKI) : Severe cholangitis (Abnormal organ functions) in view of AKI.

Plan :

- IV antibiotics + hydration.
- Nephrology consultation.
- Plan for ERCP (Endoscopic retrograde cholangiopancreatography) after confirming diagnosis.

Further investigations :

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MRCP (magnetic resonance cholangiopancreatography) :



Normal biliary system seen on MRCP

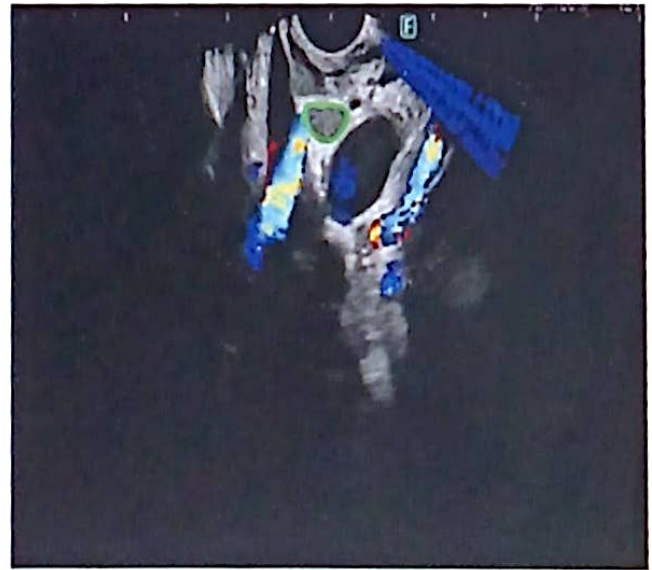


Periportal echogenicity

Endoscopic ultrasound (EUS) :



EUS showing normal common bile duct



EUS showing reactive lymph node

- Periportal echogenicity (Periportal edema) was seen on EUS & MRCP.
- Periportal edema + gall bladder wall thickening : Features of acute hepatitis.

missed history :

- Detailed drug history including complimentary medicine intake was taken.
- Prescription from the original clinic two weeks ago : Azithromycin + etoricoxib.
- Azithromycin is known to cause cholestatic hepatitis.



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Transjugular liver biopsy :

- Transjugular liver biopsy is indicated because percutaneous liver biopsy (Probe passes through liver capsule) in the setting of AKI, increases the risk of bleeding.

Findings :

- Acute hepatitic pattern liver injury with moderate lobular necroinflammatory activity, bridging & centrilobular necrosis.
- In correlation with clinical history, compatible with drug induced liver injury.

Treatment :

- Short course of steroids was given as drug induced liver injury as some immune based phenomenon.
- Follow-up week later with liver tests, were returning to baseline.

Diagnosis at discharge :

- Intrahepatic cholestasis.
- Drug induced cholestatic hepatitis.
- NSAID induced acute kidney injury.
- Culprit drugs : Azithromycin & NSAIDs.

Classical clinical cases with altered liver chemistries :

Scenario 1 :

- 21 year old asymptomatic male brought by his anxious mother after noticing yellowish discolouration of his eyes.
- Findings :
 - Total bilirubin (TB) : 3.1 mg/dl (DB : 0.8, IB : 2.2).
 - Normal ALP.
 - USG abdomen : Normal liver.
 - Normal transaminases.
- Diagnosis :
 - Gilbert's syndrome (Benign course throughout the life) → Reassurance given.

Scenario 2 :

- 58 year old male diabetic during a routine health check up.
- Findings :
 - AST (SGOT) : 64.
 - ALP : 224.
 - ALT (SGPT) : 42.
 - TB : 1.8 (DB : 1.2, IB : 0.6).
- USG abdomen : Irregular liver margin with coarsened echotexture with large confluent hypodense lesion.



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- Diagnosis :
 - Chronic liver disease (CLD) with Hepatocellular carcinoma (HCC) → Prognosis is not good.

Scenario 3 :

- 30 year old female with recent h/o fever presenting with tiredness and high coloured urine.
- Findings :
 - AST (SGOT) : 1340.
 - ALT (SGPT) : 1800.
 - ALP : 134.
 - TB : 6.5 (DB : 4.2, IB : 2.3).
 - IgM HAV : Reactive.
- Diagnosis :
 - Acute viral hepatitis A → Hepatitis resolves within few days.

Conclusion :

- Magnitude of the derangement in liver tests is not important.

Context of the altered liver chemistries :

Background :

- Normal variants :
 - Jaundice due to indirect hyperbilirubinemia with total bilirubin levels < 4 mg/dl & other liver chemistries are normal : most likely, this presentation is of **Gilbert's syndrome** → Excessive work up is not needed.
 - Young child, pregnant women & lactating women may have slightly elevated ALP → Excessive work up is not needed → Only ultrasound & complete LFT is needed to rule out any abnormalities.
- Setting :
 - The setting in which the patient is being evaluated is important.
 - In the ER, if the patient presents with fever + elevated SGOT/SGPT (>1000 U/L) : **Acute viral hepatitis**.
 - In the CCU, if the patient has elevated SGOT/SGPT (>1000 U/L) & is on inotropes : **Ischemic/ congestive hepatitis**.

- Diagnosis :
 - Chronic liver disease (CLD) with Hepatocellular carcinoma (HCC) → Prognosis is not good.

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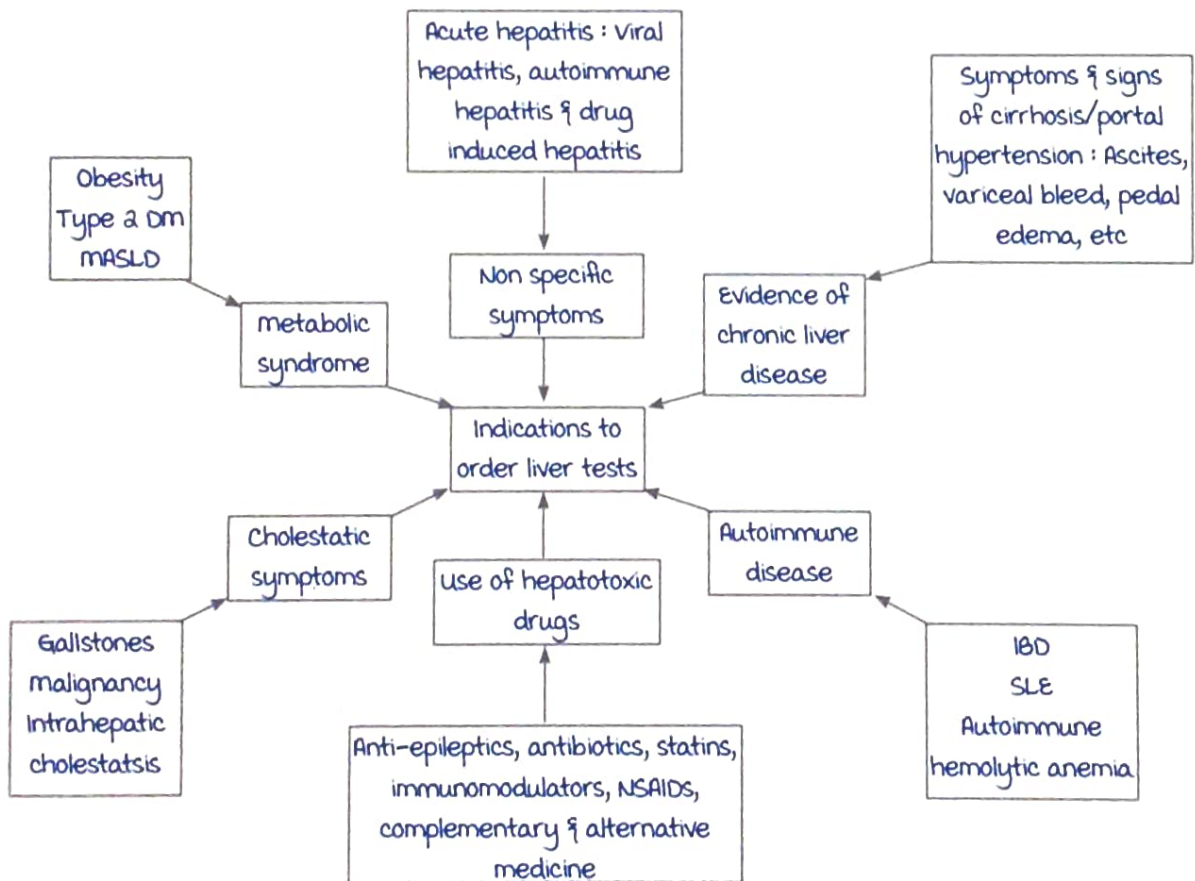
Extent :

- magnitude is misleading :
 - metabolic associated steatotic liver disease (MASLD), alcoholic liver disease (ALD) & hepatitis C infection : LFTs will be relatively normal, but that doesn't mean pathology doesn't exist.
 - Chronic liver disease will not present with jaundice & deranged LFT, until the final phases of the disease.

Duration :

- Always check past records for baseline LFT.
- An abnormal LFT is not always an index presentation.

Indications for ordering liver tests :



Note :

- Patients with Inflammatory bowel disease (IBD) presents with deranged liver tests : Primary sclerosing cholangitis (PSC), drug induced liver injury & IgG4 cholangitis.

Clinical clues from history suggesting specific liver diseases :

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History	Likelihood
Age	Elderly patient : malignancy middle aged (40 years) female with abdominal pain, pruritis, fatigue : Primary biliary cholangitis (PBC)
Ethnicity/region/ travel	South India : Hepatitis A North India : Hepatitis A & E Rural areas : Scrub typhus
Sex	Female : SLE, PBC, Autoimmune hepatitis (AIH) male : PSC, IgG4 disease
Jaundice, ascites, hematemesis	Chronic liver disease (CLD)
Pruritis, clay coloured stools	Cholestatic syndromes
Comorbidities like Type 2 DM & obesity	MASLD
Pregnancy, OCP	Budd Chiari syndrome
Associated illness	IBD, thyroid, cardiac, pulmonary & haematologic pathologies

Patterns of liver chemistry derangement

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Hepatocellular pattern :

- Predominantly, ALT based injury.
- R ratio > 5 → Hepatocellular injury.

$$R \text{ ratio} = \frac{\frac{\text{ALT levels (Patient)}}{\text{ALT levels (upper limit of normal)}}}{\frac{\text{ALP levels (Patient)}}{\text{ALP levels (upper limit of normal)}}}$$

Cholestatic pattern :

- Predominantly, ALP based injury.
- R ratio < 2 → Cholestatic pattern.

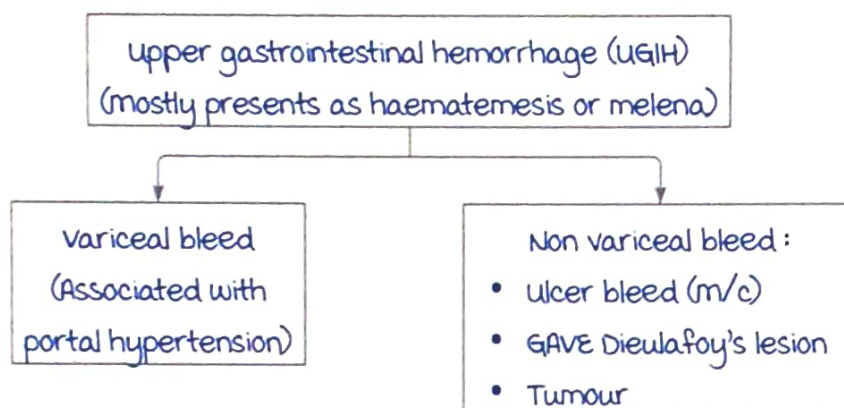
APPROACH TO NON VARICEAL UGIH

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Introduction

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Overview :



Case scenario :

- A 55 year old male patient with history of stable CAD on tab aspirin 75 mg OD presented with vague upper abdominal pain followed by two episodes of hematemesis and melena with syncopal symptoms.
- On evaluation at ER, his vitals were as follows :
 - GCS : Full.
 - PR : 122 bpm; BP : 100/65 mm Hg; Temp : Normal; RR : 18/min.
 - P/A : Epigastric tenderness.
- Investigations :
 - Hb : 8.7 g/dl.
 - Platelets : 2.3 L.
 - Urea : 68.
 - Creatinine : 1.2 mg/dl.
 - Bilirubin : 1.2 (0.5/0.7).
 - AST/ALT : 56/72.
 - Albumin : 4.1.
 - PT-INR : 1.2.

Note :

- Pain associated with haematemesis is more favour of **ulcer bleed/NSAID associated bleed**.
- Syncopal symptoms suggest significant bleed and need endoscopy after stabilization.

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Factors in favour of variceal v/s non variceal bleed :

Variceal bleed	Non variceal bleed
• H/o CLD • Thrombocytopaenia suggest portal hypertension • High AST/ALT ration in CLD • Low albumin suggest CLD • Derange PT-INR (Not specific)	• H/o chronic NSAID use, CAD or CVA.

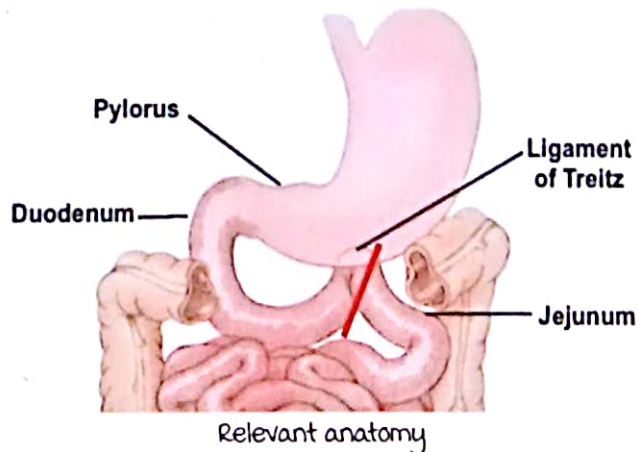
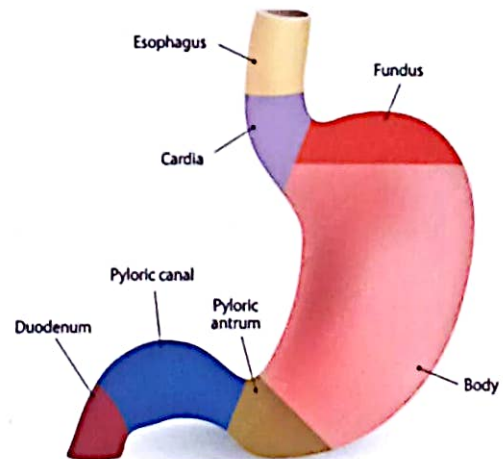
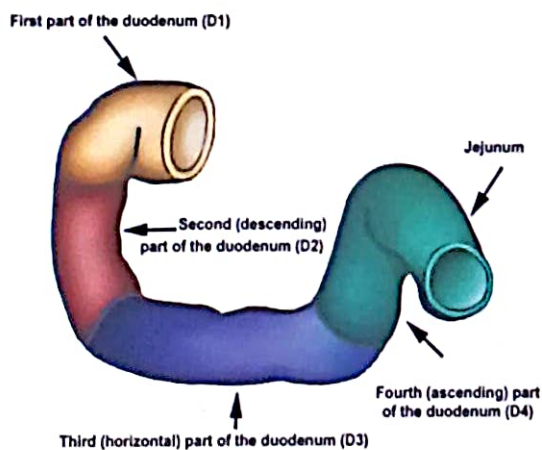
- Significance :

- medical management of variceal bleed & non variceal bleed are different.

Relevant anatomical considerations :

Important landmarks :

- Upper GI bleed : Anywhere between oropharynx and ligament of Treitz.
- most common site of ulcer in stomach : Lesser curve, antro-pyloric area.
- It is also important to examine D1 or the duodenal bulb.

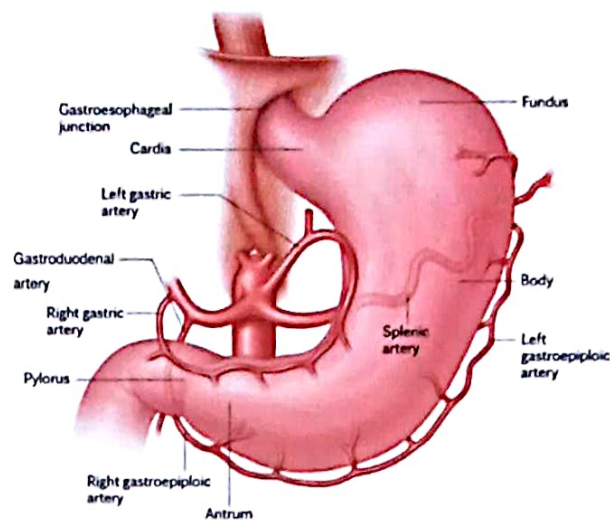


Relevant anatomy

Blood supply of stomach :

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- Lesser curve :
 - Left gastric artery, branch of celiac artery.
 - Right gastric artery, branch of common hepatic artery.
- Greater curve :
 - Left gastroepiploic artery, branch of splenic artery.
 - Right gastroepiploic artery, branch of gastroduodenal artery.
- Fundus : Short and posterior gastric branches of splenic artery.



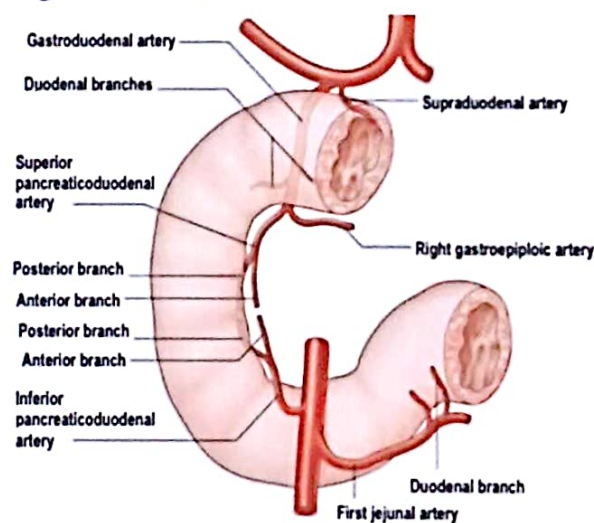
Blood supply of stomach

Note :

- Some instances the large ulcer with scarring along lesser curvature can be rarely due to **erosion of left gastric artery** → Torrential bleeding →
- Endoscopic should be done with suitable endoscopic instruments in a centre with trans arterial embolization with IR or at least surgical back up

Blood supply of duodenum :

- Supplied by branches of :
 - Celiac artery.
 - SMA.
- Proximal duodenum : Superior pancreaticoduodenal artery, a branch of gastroduodenal artery.
- Distal duodenum : Inferior pancreaticoduodenal artery, a branch of SMA.



Blood supply of duodenum

Role of diagnostic radiology :

- CT Angiography (0.3 ml/minute bleed) :
 - 85% accuracy but 40% for **intermittent bleeding**.
 - Helps in treatment planning.
- Catheter angiography (0.5-1.0 ml/minute bleed) : **Therapeutic procedures** can be done along with diagnostic procedures with the help of interventional radiology.
- Tagged (Tc 99) RBC scan (0.1 ml/minute bleed) : Low yield, high false positive and negative rates, poor localization.

Pre-endoscopic management

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Risk stratification :

- A Glasgow-Blatchford score of 0-1 reflects risk of transfusion or intervention as 'very low risk' of <1% and can be safely discharged for elective endoscopy.

Blood transfusion :

- Recommendations :
 - Restrictive transfusion safer than liberal transfusion.
 - A target threshold of 7 gm/dl for blood transfusion.
- Evidence :
 - Two randomized trials comparing restrictive vs liberal.
 - One showed no difference, other showed lesser mortality and lesser cardiac complications in restrictive group.
- Caveats :
 - A threshold of 8 gm/dl is required in associated cardiac disease.
 - In hypotensive patients, Hb may be an overestimate due to delayed equilibration with plasma, therefore Hb threshold is 8.

Risk factors at admission	Factor score
Blood urea nitrogen (mg/dL)	
18.2 to <22.4	2
22.4 to <28	3
28 to <70	4
≥70	6
Haemoglobin	
12 to <13 for men and 10 to <12 for women	1
10 to 12 for men	2
<10	3
Systolic blood pressure	
100-109	1
90-99	2
<90	3
Heart rate (Beats per minute)	
≥100	1
melena	1
Syncope	2
Heart disease	2
Cardiac failure	2

medical therapy :

- Recommendations :
 - Prokinetic agents like intravenous erythromycin or metoclopramide may be beneficial prior to OGD.
 - Intravenous PPI may or may not be empirically given pre endoscopy.
- Evidences :
 - Prokinetic agents have been shown to improve endoscopic visualization by distally pushing blood and clots.
 - Pre procedure PPI has no effect on mortality but reduced endoscopic stigmata of high risk bleeding.